# Tumble Bunnies

**Kit contains:**

- 2 tumble bunny templates
- 2 marbles
- 1 pencil
- 1 strip of shelf liner
- 1 protractor transparency

**You will need:** scissors, tape, coloring supplies (optional), and a surface to use as a ramp.

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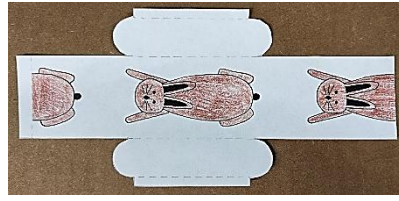
*Your kit comes with 2 tumble bunny templates. This is to provide backup in case of an assembly-related "oops" situation or to continue the fun when your first tumble bunny wears out.*

# INSTRUCTIONS

**Step 1.** Color your first tumble bunny if desired. Then cut it out in ONE PIECE.



**Step 2.** Fold the side flaps and side flap tabs along the dashed lines.

**Step 3.** Connect your bunny halves and tape into a loop.

**Step 4.** Tape one side closed. (The tab should be on the outside.) Then put TWO marbles inside the bunny.

*Source: madebyjoel.com/2011/03/tumble-bunnies.html*

**Step 5.** Tape the second side closed. Yes, I know, this side is more challenging to tape. Your tumble bunny is now complete.

## GET READY TO TUMBLE!

Find a flat surface to use as a ramp. This could be a length of wood or a boardgame box or a table you're allowed to tilt. Attach your strip of shelf liner to your ramp to increase **friction**. This will help your bunny tumble instead of slide.

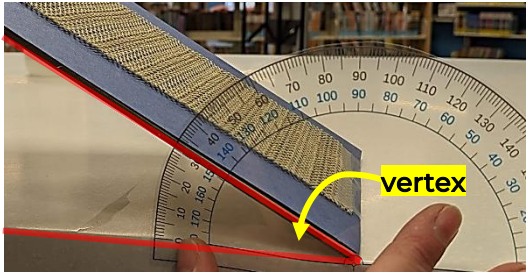
*Composite image to show movement*

Tilt your ramp, set your tumble bunny on top, and let go! **Gravity** causes the loose marbles in the bunny tube to roll from the uphill end to the downhill end. This makes the top/empty part pivot around the weighted/bottom part. The process repeats until the marbles stop rolling.

# WHAT'S YOUR ANGLE?

Your STEMonade kit contains a **protractor**. A protractor is a tool for measuring **angles**. The unit of measure is **degrees**.

acute angle | right angle | obtuse angle | straight angle




Your challenge is to measure and record the angle of your ramp. Align the center target with the **vertex** to record the angle of its tilt. The angle in this picture is 30°. What is the smallest angle at which your bunny tumbles? What is the greatest angle at which your bunny tumbles?